What is claimed is:

1. A pipe comprising an ethylene base polymer comprising ethylene and an α-olefin having 3 to 20 carbon atoms, wherein (A) a maximum value of the residual stress is 0.13 MPa or less; (B) the crystallinity is 0.630 to 0.850; (C) a gradient of the crystallinity against a thickness of the pipe is 0.465 or less; and (D) the pipe has a thickness of 5 to 50 mm.

2. The pipe as described in claim 1, wherein the pipe has a tie molecule-forming probability of 0.12 or more.

3. The pipe as described in claim 1, wherein the ethylene base polymer has a melt index of 0.02 to 0.18 g/10 minutes and a complex viscosity coefficient of 1×10^3 to 4×10^3 Pa·sec at a frequency of 100 sec^{-1}.

4. The pipe as described in claim 1, wherein the hoop stress which is determined by applying a hydrostatic pressure to the pipe at a temperature of 20°C is 12.00 MPa or more at a breaking time of 1000 hours.

5.   The pipe as described in claim 1, wherein according to ISO 13479, the pipe is provided on a surface thereof with 4 notches (notch depth rate: 20 %) and has a breaking time of 165 hours or longer which is measured at a temperature of 80°C under a pressure of 0.92 MPa, and the pipe having a notch depth rate of 40 % has a breaking time of 20 hours or longer.

6.   A pipe comprising an ethylene base polymer comprising ethylene and an α-olefin having 3 to 20 carbon atoms, wherein according to ISO 13479, the pipe is provided on a surface thereof with 4 notches (notch depth rate: 20 %) and has a breaking time of 165 hours or longer which is measured at a temperature of 80°C under a pressure of 0.92 MPa, and the pipe having a notch depth rate of 40 % has a breaking time of 20 hours or longer.